HELICOPTER OPERATIONS 8363
(Revised September 2001)

GROUND SAFETY 8363.1
(Revised September 2001)

- Always approach and leave the helicopter in full view of the pilot and only upon his approval. **Under no circumstances** approach/depart or allow others to approach/depart the helicopter from the tail rotor area.

- Do not face the helicopter during takeoff and landing operations unless wearing goggles.

- Helitack crewpersons, passengers and ground personnel will wear hard hats with chin straps fastened, hearing protection, and goggles or other appropriate PPE.

- No one is to stand under the flight path of a helicopter unless trained in and performing a hover hookup.

- Do not place additional items of cargo on the helicopter without the pilot's permission.
- When approaching the helicopter with hand tools, keep all handles horizontal to avoid contact with the main rotors.

- When available, helitack personnel will assist passengers in approaching, loading and departing the aircraft.

- All heliports will be provided with the appropriate size, class and number of fire extinguishers or fire engine.

- Static electrical charge on suspended loads should be dissipated with a grounding device before ground personnel touch the suspended load unless protective rubber gloves are worn.

- Smoking in and around helicopters is prohibited.

- All smoking is prohibited on heliports, helispots, fuel trucks, and service trucks, or helitack storage areas.

- Do not approach the helicopter from any ground that is higher than that which the helicopter is standing on or hovering over. When turning at a high speed or under bad lighting conditions, helicopter rotors are almost invisible.

- Obtain the pilot's permission to stow any gear in the aircraft. Any cargo placed in the aircraft must be securely tied down.

- All heliports and helispots must have someone in charge. Whenever possible use trained helitack personnel or supervisor. If trained personnel are not available, the crew leader will be in charge.

- Know hand signals for ground to air communications.

GENERAL OPERATIONAL GUIDELINES 8363.2

(Revised September 2001)

SUPER HUEY OPERATIONAL PROCEDURES 8363.2.1

(Revised September 2001)

Flight with passenger compartment doors open will not be allowed unless required by the mission. If so required:

- Other door configurations to meet specific mission requirements are allowed only as outlined in the Super Huey Flight Manual.

- Aircraft speed will be governed by the flight manual section covering airspeed limitations with door open.

- Doors are most likely to be lost when they are opened and closed in flight.

- The captain, or in his/her absence the pilot, will ensure that there are **no** unsecured items in the passenger compartment **prior** to takeoff.

When **helicopter-only** requests for VMP burns are made, one captain will accompany the aircraft to provide liaison between pilot and using crew.

A helitack captain may ride in the left seat during continuous external load operations (to handle radio operation, record keeping, tactical problems, etc.) if the captain and pilot feel that it would be beneficial to the mission.

HOSELAYS 8363.2.2

(Revised September 2001)

Helicopters will not make hoselays.

UNSTABLE LANDINGS 8363.2.3

(Revised September 2001)

Unstable (one skid or light on the skid) landings will only be allowed for CAL FIRE (State-owned) helicopters. Contracted or CWN helicopters are not authorized to do these types of landings.

CAL FIRE (State-owned) helicopters will only be allowed to perform unstable landings after the helitack crew and pilot have trained in them, and the pilot is subsequently checked and approved by the Aviation Management Unit staff.

HELISTEPPING 8363.2.4

(Revised September 2001)

In the event that terrain will not allow a stable landing, helistepping may be utilized provided the following conditions can be met:

- The pilot and helitack captain agree that it would be safe and necessary to do so.
- The pilot has been specifically carded by the CAL FIRE Aviation Management Unit staff to conduct helistepping operations.
- The aircraft can be maneuvered to within two feet of the ground (not vegetation--ground only).
- The pilot and helitack crew have been previously trained in helistepping.
- Tools should be dropped before personnel are on the ground, if the tools are in a separate cargo compartment. If tools have been loaded in a separate cargo compartment, the risk involved in attempting to retrieve them from the hovering helicopter may be unwarranted. If possible, a landing should be made elsewhere in terrain that will allow a stable landing as close as possible to the area that requires helistepping. This would allow the helitack crew to bring the needed tools into the cabin for the short flight to the drop zone. Tools may also be transported the short distance in an external cargo net accomplishing the mission as a combination internal-external load.

  Consideration should be given to off-loading a portion of the crew members/equipment to lighten the load and increase safety margin.

See the exhibit Helistep Training and Procedures *(coming soon).*

REMAINING AT AIRCRAFT CONTROLS 8363.2.5
(Revised September 2001)

Helicopter pilots shall not leave the controls of their aircraft while the rotors are turning, regardless of the rotor speed, unless there is another qualified helicopter pilot at the controls.

GENERAL GUIDELINES 8363.3
(Revised September 2001)

MINIMUM AIR CREW 8363.3.1
(No. 29 August 2014)

A helitack crewmember shall be assigned to any helicopter capable of carrying eight or more passengers when that helicopter is working in support of incident operations. The helitack crewmember shall assist in loading and unloading of passengers and/or equipment. It is not necessary for the crewmember to remain in the helicopter. Except during external load operations, the helitack crewmember shall remain assigned to the aircraft.

CAL FIRE helicopters shall be dispatched with a minimum crew of one pilot and one helitack captain for operational missions.

A helitack captain may occupy the left seat during external load operations (to handle complex radio operations, tactical problems, assist in insuring rotor blade clearance, etc.) if the pilot and captain concur that the captain is necessary to the mission.

INSPECTIONS AND MAINTENANCE 8363.3.2
(Revised September 2001)

ENGINE PERFORMANCE CHECKS 8363.3.2.1
(Revised September 2001)

Each day or every 10 hours which ever occurs first, all CWN aircraft will perform and record a helicopter turbine engine power check and helicopter engine power trend analysis as per contract requirements.

At least once each day that a CAL FIRE Super Huey helicopter flies, the Engine Health Indicator test shall be performed. Results shall be recorded on the Super Huey Baseline HIT worksheet attached to the FC-36 Log Book.

Anytime the Super Huey engine performance is suspect AMU Maintenance will be contacted immediately.

LOADS AND LOAD CALCULATIONS 8363.3.3

(Revised September 2001)

HELICOPTER LOAD CALCULATION 8363.3.3.1

(Revised September 2001)

The Helicopter Load Calculation, form FC-67, shall be completed at the beginning of each duty day for initial attack. Additional load calculations will be completed for specific missions, operational periods or a change in the temperature or the altitude.

One load calculation indicating the most extreme conditions under which an aircraft will be working during the operation will also suffice. One copy will be left with ground personnel. The other copy shall be given to the pilot. The pilot shall review and sign the form.

Bucket/tank loads will be within the allowable payload .

HELICOPTER COMBINATION (INTERNAL-EXTERNAL) LOADS 8363.3.3.2

(Revised September 2001)

All loads consisting of personnel, and external sling loads, including water bucket operations, shall comply with the following prior to flight:

- Analysis of risk vs. need.
- Appropriate to the model helicopter.
- Takeoff and landing sites.
- Helitack captain approval.
- Pilot-in-command approval.
- Helicopter performance.
- Pilot capability to directly observe the load and/or receive hand signals or radio communication from ground personnel.
- Lead line length.
- Mission priority.

Only mission critical personnel are allowed on the aircraft.

During all flights with combinations of personnel and external sling loads, the cargo hook electrical release will be armed at all times.

WEATHER LIMITATIONS AND NIGHT FLYING 8363.3.4

(Revised September 2001)

HELICOPTER NIGHT FLYING 8363.3.4.1

(Revised September 2001)

CAL FIRE helicopters may be flown at night in accordance with the following:

The helicopter is equipped with the following functioning equipment in addition to equipment required by FAR 91.205:

- Lighted attitude indicator, airspeed indicator, altimeter, gyrocompass, and engine instruments.
- Map light.
- Functioning flashlight.

The pilot has been approved, and is current per FARs for night operations, and his card endorsed by the Aviation Management Unit staff for night flight.

Only CAL FIRE personnel essential to the mission are on board (helitack crew, etc.). Adequate lighting, as determined by the pilot and helitack captain, is available at the departure point. The destination is a heliport or airport lighted to FAA standards and there is adequate celestial illumination enroute.

The pilot and helitack captain agree that the night operation is warranted and can be safely accomplished.

The mission is a point-to-point ferry flight only.

Missions will not be conducted in the incident operations area during official nighttime. If an aircraft is in the incident operations area when official nighttime arrives, it must, as soon as possible, do one of the following:

- Land, park, and secure the aircraft for overnight.
- Return to the helibase if there is adequate lighting at the helibase to do so.
- Return to a facility with adequate lighting as described above.

Exceptions are allowed for emergency medical evacuations, or the evacuation of aircraft from imminent danger. These situations will be allowed as long as the other parts of this regulation are adhered to. Intermittent helicopters reimbursed by the state will not fly at night unless each specific operation is approved by the Aviation Management Unit staff.

Definition of night as it applies to helicopters is in accordance with the Start Up/Cut-Off Time Charts. If the aircraft is operating in areas of low light, e.g., the shadow of a ridge or mountain, or in inclement weather, the helicopter pilot or helitack captain in charge of the helicopter may stop flight operations early but shall never extend the shutdown time.

VISIBILITY 8363.3.4.2

(No. 27 June 2012)

Helicopters shall not operate in visibility of less than 1/2 mile.

COOPERATOR HELICOPTER NIGHT FLYING 8363.3.4.2

Night flying missions by Cooperators are permitted on State Responsibility Area (SRA), in accordance with the following:

Required Conditions

One of the following conditions must exist for utilization of night flying aircraft:

- Lives are or will be threatened.
- Structures are or will be threatened.
- Resources of significant economic value are or will be threatened.
- Excessively high suppression cost will be prevented.

Flight Operation Prerequisites

Cooperator(s) may be utilized for night operations **provided a signed Operating Agreement for Aided Low-Level Tactical Night Operations has been executed and is on file with the Aviation Management Unit.** Low-level night operations are defined as flight operations below 1000 feet above ground level (AGL).

- The Incident Commander must request the air assets. CAL FIRE must assess a high probability of mission success prior to any decision to request the aircraft.
- Complete a Risk Assessment in accordance with Interagency Helicopter Operations Guide (IHOG), Chapter 3, Operational Planning 2009 Edition. This is typically completed by the Air Operations Branch Director (AOBD) or designee and approved by the Incident Commander.
- An air operations branch section shall be established for nighttime operations and staffed appropriately.
- The CAL FIRE/ USFS Go/No-Go Checklist must be completed and signed by any assigned Cooperator(s).

Approved Missions

- Fire suppression drops using fixed tank with ground fill loading
- Aerial Supervision
- Emergency hoist/rescue operations

Prohibited Missions

- All Missions that require cargo to be slung under the helicopter
- Personnel transport
- Equipment and supply transportation

Night flying operations will follow procedures established in CAL FIRE's interagency night flying guidelines (to be developed).

Note: Cooperator's night flying guidelines are acceptable until interagency guidelines are developed.

Pilot Requirements

Pilots shall possess current interagency certification with Night Vision Goggle (NVG) qualification.

Helicopter Night Flying NVG Hours ..... 50 hours
Helicopter Night Flying NVG Hours in Type ..... 25 hours
Night Vision Goggle Initial Flight Training ..... 8 hours
Night Vision Goggle Initial Ground School ..... 8 hours
Night Currency Requirements per 60 day cycle per FAR 61.57 (f)
12 Agency Specific Mission Cycles (Hoist, water drops, etc.)
Annual Recurrent Flight Training ..... 4 hours
Annual Recurrent Ground Training ..... 2 hours
Annual Recurrency Check

Note: Pilots engaged in aided night operations will utilize a conversion factor of 1.4 hours per each hour flown in that environment for the purpose of establishing accrued flight time and application of duty day limitations (Reference Section 8362.7).

Pilots must conduct all operations in accordance with the following references and incorporated herein by this reference:

- Current FIRESCOPE Night Flying Guidelines
- Cooperator NVG Operations Manual Current FAA Notice on Night Vision Imaging Systems.

Aviation Ground Support Personnel
All Cooperator aviation ground support personnel will receive annual training per cooperator's night vision goggle operations program.

After-Action Evaluation Summary
After-action summaries must be completed after each night flying operation. Special attention must be given to document successes and/or failures and will include flight hours and total gallons dropped. The Helicopter Drop Evaluation worksheet can be used to document overall operational effectiveness. A copy of the summary and drop evaluations will be submitted to the Aviation Management Unit.

FUELING AND HOT FUELING 8363.3.5
(Revised September 2001)

FUELING PROCEDURES 8363.3.5.1
(Revised September 2001)

Unless equipped with a functioning closed circuit refueling system, helicopters shall not be hot refueled. The system shall not leak. All personnel conducting fueling operations must have received specific training in helicopter fueling prior to conducting any of these procedures

Fueling procedures authorized by CAL FIRE are:

- Open-port and closed-circuit refueling (aircraft shutdown)

- Closed-circuit, hot refueling (engines running)

REFUELING 8363.3.5.2
(Revised September 2001)

Open-port or closed circuit refueling shall be used during normal operations with the aircraft shutdown. These refueling operations shall require a minimum of 2 qualified personnel and a third should be utilized if available.

REFUELING TRAINING AND PROCEDURES 8363.3.5.2.1

(Revised September 2001)

Required personnel:

1-at fuel nozzle
1-fireguard

- Aircraft refueler shall wear cotton or static resistant Nomex II clothing.
- Aircraft will be shut down and secured as required.
- No personnel are allowed in or on the aircraft during refueling. Non-essential personnel and passengers shall remain at least 100' away from aircraft during refueling.
- Position refueler next to aircraft outside rotor arc.
- Sink grounding rod as deep as possible and ground refueler.
- Bond aircraft to refueler.
- Take a fuel sample from nozzle and perform a Bright and Clear check.
- Bond nozzle at aircraft filler port.
- Open fuel filler port and fuel as per load calculation.
- Replace and secure fuel cap and disconnect nozzle bonding plug.
- Take a second fuel sample from nozzle and perform a Bright and Clear check.
- Disconnect grounding and bonding wires and clear area.
- Grounding and bonding procedures apply to all fuel transfers, i.e., drum to service unit, drum to aircraft, bulk tank to service unit, etc.
- Fire guard is posted with a "class B" fire extinguisher, of a size commensurate with the hazard potential, during fueling operations.

  - Appropriate PPE shall be utilized as necessary

Recommended personnel:

1 - at helitender / fueltender fuel controls

Helicopters will be fueled in the following manner:

REFUELING SITE SELECTION AND PREPARATION

- Insure that selected area is a safe distance (200' min.) from other activities with the exception of water point operations for fixed tanks.
- Insure that the ground can support the helitender. Be alert for sandy and muddy conditions.
- Dust abate area if needed.

DUTIES AND RESPONSIBILITIES

Parking tender

- Required for established helibases and waterpoints with multiple helicopter operations.
- Be properly dressed: Nomex, eye/hearing protection, hard hat.
- Be in a position to observe refueling operation
- Provide appropriate hand signals.
- Keep non-essential personnel at least 100' from helicopter.

Fire Guard

- Required at established helibases or waterpoints.
- Be properly dressed: Nomex, eye/hearing protection, hard hat, gloves.
- Close all windows and doors inaccessible to the pilot (hot refueling only).
- Ensure that all exterior lights on the helicopter are OFF.
- Position at an angle between the refueler and cockpit approximately 25' from the fuel receptacle with a 20 pound extinguisher.
- Remain vigilant for spillage, fire or other emergency on and around the helicopter and helitender.
- During refueling, be ready to shut off the helitender pump and valves, in the event of an emergency.

Pilot

- Land the helicopter a safe distance away from the helitender. It may be safest for the first hot refueling cycle to land the helicopter and then drive the helitender into position to establish a safe landing distance for continued operations.

- Reduce RPM to flight idle.

- Insure all windows and doors are closed.

- Be properly dressed: Flight suit sleeves rolled down, gloves on, helmet on and visor down.

- Turn off all lights, strobes, transponder, radar altimeter and unnecessary electrical equipment.

- Monitor radios with transmit selector in INT or PVT to communicate with fueling person.

- Monitor fuel gage and signal to fueling person when the desired amount of fuel has been transferred via intercomm or with the following hand signals:

    1. Arm up means more fuel.

    2. Arm down means stop fueling.

- Upon completion of fueling operation, turn ON necessary and desired electrical equipment.

Fueling Person

- Required for all hot refueling procedures.
- Perform duties of fire guard, if unavailable.
- Be properly dressed: Nomex, eye/hearing protection, gloves, hard hat or helmet (for intercom with pilot).
- Properly ground the helitender.
- Properly bond the helicopter air frame to the helitender.
- Properly bond the fuel nozzle to the helicopter air frame.
- Insure all items in the GO-NO-GO check list are complied with prior to connecting the fuel nozzle to the helicopter.
- Remove fuel caps, inspect nozzle for contamination and damage (discontinue fueling operation if necessary), connect nozzle to receiver, and begin fuel transfer.
- Inspect for leakage and discontinue operation if detected.
- Fuel as per load calculation.
- Remain attentive to pilot intercom or hand signals for fuel cutoff.
- Remove nozzle and replace caps. Properly stow nozzle.
- Remove bonding cable from helicopter.
- Double check fuel cap and bonding cables.
- Signal pilot and parking tender that refueling operation is complete with "THUMBS UP"

HOT REFUELING 8363.3.5.3

(Revised September 2001)

Hot refueling consists of a closed circuit refueling (CCR) system installed on the helicopter and service unit and is used while the helicopter engine is running with the rotor system turning. Hot refueling may be utilized when ALL of the GO-NO-GO conditions have been met. These refueling operations shall require a minimum of 2 qualified personnel and 2 additional should be utilized if available.

Required personnel:

1-pilot (at aircraft controls)
1-at helitender/fueltender fuel controls

Recommended personnel:

1-at fuel nozzle
1-fireguard

GO-NO-GO CHECKLIST

The aircraft shall have an approved (by CAL FIRE AMU)closed circuit refueling system prior to conducting any hot refueling.

Operation

- An operational necessity exists for expeditious refueling.
- There is an absence of lightning activity in the area.
- There is an appropriate refueling area available.
- Crew briefings have been completed for hot refueling procedures.
- Required personnel are available.
- Personnel have received training for their duty assignments.
- Personnel are properly clothed in cotton or static resistant Nomex III.
- Non-essential personnel are cleared 100' from the area.
- The helitender's daily fuel system check has been completed.
- The helitender's monthly grounding and bonding test has been completed.
- Proper fuel type is used.
- Helitender is positioned safely beyond the rotor diameter of all helicopters.
- Helitender is properly grounded.

- Helitender is properly bonded with helicopter.
- Fire guard is posted with 20 pound fire extinguisher.
- Pilot is sole occupant of the helicopter.
- Helicopter is at flight idle.
- No loading of retardant, foam or water during refueling.
- No cargo loading or off-loading during refueling.
- All windows and doors are closed.
- All lights, strobes, radar altimeter, transponder, and unnecessary electrical equipment is turned off.
- Pilot has placed the captains INT switch on Hot or PVT to communicate with refueler and monitors radios during refueling.

REFUELING SITE SELECTION AND PREPARATION

- Ensure that selected area is a safe distance (200' min.) from other activities with the exception of water point operations for fixed tanks.
- Ensure that the ground can support the helitender. Be alert for sandy and muddy conditions.
- Dust abate area if needed.

DUTIES AND RESPONSIBILITIES

Parking tender

- Required for established helibases and waterpoints with multiple helicopter operations.
- Be properly dressed: Nomex, eye/hearing protection, hard hat.
- Be in a position to observe refueling operation.
- Provide appropriate hand signals.
- Keep non-essential personnel at least 100' from helicopter.

Fire Guard

- Required at established helibases or waterpoints.
- Be properly dressed: Nomex, eye/hearing protection, hard hat, gloves.
- Close all windows and doors inaccessible to the pilot (hot refueling only).
- Insure that all exterior lights on the helicopter are OFF.
- Position at an angle between the refueler and cockpit approximately 25' from the fuel receptacle with a 20 pound extinguisher.
- Remain vigilant for spillage, fire or other emergency on and around the helicopter and helitender.
- During refueling, be ready to shut off the helitender pump and valves, in the event of an emergency.

Pilot

- Land the helicopter a safe distance away from the helitender. It may be safest for the first hot refueling cycle to land the helicopter and then drive the helitender into position to establish a safe landing distance for continued operations.
- Reduce RPM to flight idle.
- Insure all windows and doors are closed.
- Be properly dressed: Flight suit sleeves rolled down, gloves on, helmet on and visor down.
- Turn off all lights, strobes, transponder, radar altimeter and unnecessary electrical equipment.
- Monitor radios with transmit selector in INT or PVT to communicate with fueling person.
- Monitor fuel gage and signal to fueling person when the desired amount of fuel has been transferred via intercomm or with the following hand signals:

    1. Arm up means more fuel.
    2. Arm down means stop fueling.

- Upon completion of fueling operation, turn ON necessary and desired electrical equipment.

Fueling Person

- Required for all hot refueling procedures.
- Perform duties of fire guard, if unavailable.
- Be properly dressed: Nomex, eye/hearing protection, gloves, hard hat or helmet (for intercom with pilot).
- Properly ground the helitender.
- Properly bond the helicopter air frame to the helitender.
- Properly bond the fuel nozzle to the helicopter air frame.
- Ensure all items in the GO-NO-GO check list are complied with prior to connecting the fuel nozzle to the helicopter.
- Remove fuel caps, inspect nozzle for contamination and damage (discontinue fueling operation if necessary), connect nozzle to receiver, and begin fuel transfer.
- Inspect for leakage and discontinue operation if detected.
- Fuel as per load calculation.
- Remain attentive to pilot intercomm or hand signals for fuel cutoff.
- Remove nozzle and replace caps. Properly stow nozzle.
- Remove bonding cable from helicopter.
- Double check fuel cap and bonding cables.
- Signal pilot and parking tender that refueling operation is complete with "THUMBS UP"

(see next section)

(see HB Table of Contents)

(see Forms or Forms Samples)